

DETAILED ACTION

1. This action is responsive to amendment filed 9/9/2010.

Response to Remarks/Amendment

2. Applicant's remarks/amendment, filed 8/2/2010, has been fully considered, and as a result claims 1-2, 4-6, 8, 19-20, 22, 34, 35, 47, 54-61, 64-68, 70-92, 98-104, are now indicated allowable. However, in order to advance prosecution in the case an examiner's amendment was considered necessary, so as to overcome some minor deficiency in the claims 54, 86, 90-92.

3. The applicant was given an opportunity via a telephone call on 11/17/2010, to cancel the claims 36, 95-102, the applicant has failed to respond to that request.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Thomas M. Bonacci on 11/30/2010 to an earlier call on 11/18/2010 and 11/22/2010.

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

IN THE CLAIMS:

Claims 23, 37, 62, 63, 93-97, 105-109 stand cancelled.

Claim 54, line 3, the term "averaging of pilot signal" has been replaced with

-- averaging of pilot signals --.

Claim 64, line 1-2, the term "as claimed in any one of claims 54 or 62," has been replaced with -- as claimed in claim 54 --.

Claim 65, line 1-2, the term "as claimed in any one of claims 54 or 62," has been replaced with -- as claimed in claim 54 --.

Claim 67, line 1-2, the term "as claimed in any one of claims 54 or 62," has been replaced with -- as claimed in claim 54 --.

Allowable Subject Matter

5. Claims 1-2, 4-6, 8, 19-20, 22, 34, 35, 47, 54-61, 64-68, 70-92, 98-104.

Reason for Allowance

6. The following is an examiner's statement of reasons for allowance:

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a method (device) for estimating a channel comprising in combination with other claimed limitations, wherein said weighting factors are determined according to said leaning positions of said pilot symbols in slots of said control channel. Such limitations as recited in the independent claims 1, 8, 47, 85 is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a channel estimating device comprising in combination with other claimed limitations, wherein said weighting factor generating means divides the data symbols in the slots of said data channel into a plurality of data symbols sections, selects the pilot symbols appropriate for calculating channel estimation value of the data

symbols in each of the data symbol sections, and generates the weighting factors to be used for weighting and averaging the pilot symbols; and said channel estimation value calculating means takes weighted average of said pilot symbols using said weighting factors and calculates the channel estimation value of the data symbols of each of the data symbol sections, wherein in order to calculate the channel estimation value of the data symbols of the last data symbol section of the i^{th} (i : integer) slot and to calculate the channel estimation value of the data symbols of the first data symbol section of the $(i+1)^{\text{th}}$ slot, said weighting factor generating means selects the same pilot symbol and generates the weighting factors to be used for weighting and averaging the pilot symbols. Such limitations as recited in the independent claims 4, 5, 19, 20, 34, is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a channel estimating device comprising in combination with other claimed limitations, wherein the channel estimation device further comprises: fading frequency decision means for deciding the fading frequency based on an inner product value of said pilot symbols; and factor altering means for altering the factors that are used in taking said weighted average according to the fading frequency decided by said fading frequency decision means. Such limitations as recited in the independent claims 6, 22, 35, is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a demodulating device comprising: in combination with other

claimed limitations, selection of said N' weighting sequences being performed per a predetermined period, for remaining data sequences until performing said reliability judgment again said channel estimation means deriving N' channel estimation value by weighted averaging in time using N' weighting sequences, said compensating means compensating data sequences using N' channel estimation values, said RAKE combining means RAKE combining respective of N' data sequences after compensation, and said reliability judgment means selecting one data sequence having the highest reliability from said N' data sequences. Such limitations as recited in the independent claims 54, 70, 78, is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a demodulating device comprising: in combination with other claimed limitations, frame error detecting means for detecting the presence or absence of a frame error based on a decoding result of said CRC; number-of-frame-error counting means for counting said number of the frame error in a previously-determined measuring time; signal-to-noise ratio calculating means for calculating a signal-to-noise ratio (ratio of a signal power to a noise power) of each of the data sequences after said RAKE combination; signal-to-noise ratio averaging means for averaging the calculation result of said signal-to-noise ratio for a previously-determined measuring time; and weight sequence and data selecting means for selecting the weight sequence having high reliability and the data sequence that is demodulated using the weight sequence so selected based on said counting result of the frame error. Such limitations as recited in

the independent claims 86, 89, 90, 92, 98, 101, 102, 104, is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a demodulating method (device) comprising: in combination with other claimed limitations, wherein said reliability judgment step comprises: error-correction decoding the data sequence after said RAKE combination; extracting likelihood information calculated when performing error-correction decoding of each of the data sequence; averaging said extracted likelihood information for a previously-determined measuring time; and selecting the weight sequence having high reliability and the data sequence that is demodulated using the weight sequence so selected based on said averaged likelihood information. Such limitations as recited in the independent claims 87, 99, is neither anticipated nor rendered obvious by the prior art of record.

The prior art of record, either considered alone or in combination, neither teaches nor renders obvious a demodulating method (device) comprising: in combination with other claimed limitations, wherein said reliability judgment step comprises: calculating electric power of each of the data sequences after said RAKE combination; averaging the calculation result of said electric power for a previously-determined measuring time; and selecting the weight sequence having high reliability and the data sequence that is demodulated using the weight sequence so selected based on said averaged electric power. Such limitations as recited in the independent claims 88, 91, 100, 103, is neither anticipated nor rendered obvious by the prior art of record.

Claims 2, 55-61, 64-68, 71-77, 79-84 are allowed by virtue of its dependency to claims highlighted above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutbuddin Ghulamali whose telephone number is (571)-272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
November 21, 2010.

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611